A Hands-on Workshop for the Cray Quad Core XT4 April 14 - 16, 2008

First Day Morning

8:00 am

Working breakfast to allow participants to discuss their work for the day¹s meeting, speakers to check slides, session chairs to finalize introductions, registration pickup for late arrivals.

8:30 am

I. Introduction to the Workshop (15 Minutes) John Levesque, Cray Inc
II. Architecture of the AMD Quad Core (45 Minutes) Brian, Waldecker, AMD Corp.
a. Architectural features that the application developer needs to know i. Functional Units ii. Cache Architecture iii. Memory interface b. Issues using Quad core node in XT4 MPP

9:30 am

II. Compiler considerations when using the Quad Core (45 Minutes) Nathan Wichmann, Cray Inc.
a. Vectorization to use SSE instructions b. Memory pre-fetching c. How to use shred memory parallelization in the compiler

10:15 am

Break

10:30 am

III. Using Craypat to profile applications on the XT4 (60 Minutes) Luiz DeRose, Cray Inc.

11:30 am

IV. Using NCCS Cray XT4 System Jeff Larkin, Cray Inc
a. Logging onto the system
b. Compiling applications
c. Running jobs batch & interactive

Noon - 1:00 pm

Working lunch - obtain user account information; log onto system; compile applications. Don Frederick, NCCS/ORNL

1:00 pm

NCCS and Cray Staff -

First Day Afternoon
Continue working on assignment obtain profiles of your application running on the XT4-Quad core

2:30 pm

Break

2:45 pm

First Day Afternoon Continue working on assignment obtain profiles of your application running on the XT4-Quad core

Second Day Morning

8:00 am

Working breakfast to allow participants to discuss their work for the day¹s meeting, speakers to check slides, session chairs to finalize introductions, registration pickup for late arrivals. Continue working on assignment obtain profiles of your application running on the XT4-Quad core

8:30 am

V. Optimizations for the AMD Quad Core (90 Minutes) Jeff Larkin, Cray Inc.
a. Optimization techniques that the application developer needs to know i. Vectorization ii. Blocking for cache iii. Using prefetch directives

10:00 am

Break

10:15 am

VI) Performance analysis and visualization with CrayPat and Cray Apprentice2.

a) Collecting and understanding hardware performance counters
b) Identification of load inbalance
c) Profile visuzalization with Cray Apprentice2

Noon - 1:00 pm

Working lunch - obtain user account information; log onto system; compile applications. Finsih first day assignment.

1:00 pm

Second Day Afternoon Assignment optimize your application for node performance

2:30 pm

Break

2:45 pm

Second Day Afternoon Assignment optimize your application for node Performance (continued)

Third Day Morning

8:00 am

Working breakfast to allow participants to discuss their work for the day¹s meeting, speakers to check slides, session chairs to finalize introductions, pickup for late arrivals. Continue working on assignment optimize your application for node Performance (continued)

8:30 am

VII. Optimizing for the Distributed Shared Memory MPP (120 Minutes) John Levesque, Cray Inc.
a. Optimization techniques that application developer need to know about i. OpenMP ii. Pthreads iii. Mixing MPI and OpenMP/Pthreads

10:30 am

Break

10:45 am

VIII) Using CrayPat and Cray Apprentice2 for performance analysis of MPI, OpenMP, and Mixed mode applications (45 minutes) Heidi Poxon, Cray Inc.

IX) The Cray Scientific Libraries (30 minutes), Adrian Tate, Cray Inc.

Noon - 1:00 pm

Working lunch - obtain user account information; log onto system; compile applications. Finish second day day assignment.

1:00 pm

Third Day Afternoon Assignment optimization your application across the MPP

2:30 PM

Break

2:45 pm

Third Day Afternoon Assignment optimize your application across the MPP (continued)